Does Marriage Matter? Marital Status as a Moderator of the Relationship between Emotion Regulation and Impact of Seizures

by

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ABSTRACT

Seizure disorders are a widespread health concern (England, Liverman, Schultz, & Strawbridge, 2012). Past research shows that a good quality marital relationship can have numerous health benefits (Homish & Leonard, 2008); however, there is little evidence to show that individuals suffering from seizures are receiving any of these marital benefits. Instead, most research suggests that individuals with a seizure disorder are significantly less likely to marry, have more marital conflict, and report the seizures as a main reason for divorce (Chen, et al., 2013). The current study included 67 individuals who self-reported that they suffered from a seizure disorder. These individuals took part in an online survey that included questions about their experience with seizures, their strategies for managing emotions, and their relationship (marital) status. It was hypothesized that individuals who were married would report fewer emotion regulation difficulties and be less impacted by their seizures than those who were unmarried. The results of this study showed that: 1) married and unmarried individuals did not differ in reported emotion regulation difficulties; 2) contrary to predictions, married individuals were *more* impacted by their seizures than unmarried individuals; 3) greater emotion regulation difficulties (specifically difficulty accepting emotions and difficulty carrying out goal-directed behavior when upset) were associated with a greater perceived impact of seizures on one's life; and 4) marriage moderated the relationship between emotion regulation difficulties and impact of seizures, such that difficulty accepting emotions predicted a greater impact of seizures on one's life for married but not unmarried individuals. This was not the case for another facet of emotion regulation measured, namely difficulties engaging in goal-directed behavior when upset.

An important conclusion from this study is that a failure to accept emotions may be more likely to contribute to seizure impact among married than unmarried individuals. Promoting acceptance of emotions, perhaps in the context of one's marital relationship as well as in general, may be beneficial for individuals suffering from a seizure disorder.

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Emotion regulation is a complex set of processes that affect and are affected by other domains of an individual's life, such as health and romantic relationships. For example, effective emotion regulation strategies can improve health (Berking et al., 2012), whereas poor emotion regulation is associated with depression, anxiety, chronic pain, cancer, and early mortality (reviewed in Gross & Munoz, 1995). Romantic relationships, specifically marital relationships, are also able to influence physical (Homish & Leonard, 2008) and mental health (Gerstoff et al., 2013). An individual's romantic partner can help promote the use of positive emotion regulation strategies or, conversely, can increase the chances of that individual adopting negative emotion regulation strategies (Randall & Butler, 2013).

The present study examines marital status and emotion regulation in a sample of individuals with seizure disorders. As discussed below, seizure disorders such as epilepsy, and conditions which mimic epilepsy (i.e., non-epileptic seizures) are fairly widespread health concerns and are associated with emotion regulation difficulties; however, these conditions are understudied with respect to relations among marital status, emotion regulation, and the impact of seizures on one's life. As the literature on intersections of these constructs is limited, the below literature review offers background on emotion regulation, marriage, and health more broadly.

Lehrenr and colleagues (1999) describe commonly faced emotion regulation difficulties experienced by individuals with a seizure disorder as including poor coping abilities, depressive

symptoms, social withdrawal, and emotional impairment. Seizure disorders are also associated with relationship and marital difficulties (Chen et al., 2013; Wada et al., 2014). There is significantly less research regarding how an individual's marital status affects their seizures, including whether the individual is more or less likely to be in a romantic relationship or married.

Emotion Regulation and Health

Gratz and Roemer (2004) define emotion regulation as the ability to be aware, accepting, and understanding of emotions, as well as having control of impulsive behaviors, behaving in a way to reach desired goals of behavior, and using situationally appropriate emotion regulation strategies. If an individual is not able to meet any or all of these standards for successful emotion regulation they would be considered emotionally dysregulated. On the other hand, if an individual is able to obtain these desired forms of behavior this helps to yield a healthier outcome.

Two aspects of emotion regulation as defined by Gratz and Roemer (2004) are of interest in the present study: acceptance of emotions and the ability to behave in a way to reach desired goals. These are repeatedly shown in research to be crucial aspects of successful emotion regulation. By lacking acceptance of one's emotions an individual will be unable to reach desired goals of behavior. For instance, being accepting and tolerating of negative emotions can improve mental health by helping to reduce the intensity of negative affective states (Berking et al., 2012). Carnuta, Crispin, Vulturar, Opre, and Miu (2015) showed that not being accepting of one's emotions, perhaps caused by early life stress, is related to blunted cortisol levels, which possibly makes it more difficult for these individuals to cope with future life stress. Pepping,

O'Donovan, Zimmer-Gembeck, and Hanisch (2014) offer further evidence showing that low mindfulness was related to more reports of distress, stress, and anxiety that was attributed to not being accepting of negative emotions and being self-critical when they experienced negative emotions. Research also suggests that successful emotion regulation skills are associated with an increase in positive affect, and a decrease in negative affect and anxiety (Berking et al., 2008).

Effects of Romantic Relationships on Emotion Regulation

Emotion regulation is not always just an individual process; emotion regulation can often be influenced by others, especially in the context of a romantic relationship (Butler & Randall, 2013; Thompson & Bolger, 1999; Niven, McDonald, & Holman, 2012). In a study by Randall and Butler (2013), women who scored higher in attachment avoidance were more likely to show transmission of their partner's positive emotions inside the context of their relationship. Similarly, Bloch, Haase, and Levenson (2014) discovered that the down-regulation of women's negative behaviors increased marital satisfaction both presently and in the future for both the man and the woman. In a study that observed how couples discussed a marital conflict, it was observed that when couples used positive emotion regulation skills they were better able to cope with and solve marital conflicts (Carstensen, Gottman, & Levenson, 1995).

Among both younger and older couples, passive emotion regulation strategies and emotional suppression are associated with less understanding of one another's emotional experiences (Blanchard-Fields, Stein, & Watson, 2004). On the other hand, the relationship between emotion regulation strategies and dyadic outcomes may differ for couples where one partner has psychopathology. Kashdan, Volkmann, Breen, and Han (2007) found that women who have high levels of social anxiety and often suppress their negative emotions felt closer to

their partners, compared to the women with social anxiety who expressed their negative emotions.

Effects of Romantic Relationships on Health

Partners' influence on one another is not limited to emotion regulation-- they can have a large impact on each other's mental and physical health. Relational stress or conflict can be related to alterations in stress hormones and dysregulation of immune functioning (Robles & Kiecolt-Glaser, 2003) and marital conflict and stress can sometimes have a negative impact on fatal illnesses (Orth-Gomer et al., 2000; Coyne et al., 2001) At the same time, positive marital interactions can be related to improved mental health in married young adults compared to their single counterparts (Uecker, 2012).

One mechanism through which marriage can influence health is by influencing health behaviors. A marital relationship can influence both positive and negative health behaviors, in that one partner's health prior to the marriage is associated with change over time in the other partner's health behavior (Homish & Leonard, 2008). This has been examined largely in the context of eating and exercising habits (e.g., Markey, Markey, & Birch, 2001). There are other ways relationship partners may promote health, such as seeking health care when needed (Thoits, 1986).

There is ample evidence to suggest that romantic partners influence one another's health behaviors and overall health. Studies also have examined whether being married compared to being single makes an individual more or less healthy. Past research demonstrates that marriage does have positive health effects, but that to receive these benefits, the marriage needs to be

perceived as positive (Gove, Hughes, & Style, 1983). A meta-analysis of 130 empirical studies examining if being married is better for an individual's health and well-being found that marriage exerted positive effects on stress and emotion regulation primarily through continuous interpersonal closeness, emotional gratification, and support in daily hassles (Coombs, 1991).

Seizures as a Widespread Health Problem

While marriage may help buffer individuals from a wide range of health problems, less is known about how marriage may offset the potentially negative repercussions of one common health problem, namely seizures. Epilepsy is the most common seizure disorder and the fourth most common neurological condition, affecting more than 65 million people worldwide (Epilepsyfoundation.com). Epilepsy is considered a, "spectrum of disorders," having a wide range of severities, and a multitude of types and causes (England, Liverman, Schultz, & Strawbridge, 2012). England and colleagues (2012) also report that living with epilepsy is just as challenging as managing the seizures themselves. Individuals with epilepsy often face a variety of emotional problems, stresses related to school and work difficulties, and lower amounts of social support, which affects their ability to be able to handle day-to-day activities (Kobau et al., 2007). Greater seizure frequency is associated with reports of lower quality of life (Leidy et al., 1999).

Epilepsy and Emotion Regulation

Epilepsy is associated with problems suggesting emotion regulation difficulties, including increased levels of depression, anxiety, and alexithymia (Bewley, Murphy, Mallows, & Baker, 2005). Individuals with epilepsy report feeling a loss of control over their lives and report

difficulty coping with life events (Lehrner et al., 1999). In one study, epileptic individuals were at a significantly higher risk for suffering from depression and anxiety compared to a community sample and were more likely to use negative coping mechanisms during times of stress (Bautista & Erwin, 2013). Piazzini, Canevini, Maggiori, and Canger (2001) show further support that epileptic individuals show the highest risk for experiencing major depression, it was said that the depression was a cause of specific changes in brain functioning versus being a product of the disability.

Cognitive impairment is something that can be related to emotion regulation difficulties. Duncan and Thompson (2003) reported in their review of cognitive impairments in epilepsy suggest that perhaps it could be the emotion regulation difficulties themselves that leads to the cognitive impairments such as difficulties with consolidation of memories. In sum, there are clear links between emotion regulation difficulties and seizure disorders, with seizures potentially an effect of emotion regulation difficulties and/or stemming from the seizures themselves.

Epilepsy and Marriage

Very little is known about the effects of seizures on marital relationships. Elliott, Charyton, Sprangers, Lu, and Moore (2011) report that individuals suffering from epilepsy are more likely to report never being married compared to controls. Much of the existing research shows that individuals with epilepsy are at a significantly higher rate for never being married compared to their community based counterparts (Kim et al., 2010). Those with epilepsy report fear of discrimination for their seizures as a reason to never even pursue a romantic relationship, even among individuals who felt that their seizures were well controlled (Kim et al., 2010). For

those individuals with seizure disorders who do marry, they typically report a higher level of marital discord compared to controls, and lower marital adjustment scores were related to depressive and anxious symptoms (Chen et al., 2013). Research shows that individuals with epilepsy also report that their seizures are a significant factor for their divorce; in one study 24% reported this (Wada et al., 2014). Another issue discussed in this article is that sometimes individuals with seizures will not disclose their illness with their romantic partner until after marriage, and that divorce could possibly be reduced by having more open and honest conversations about an individual's seizures beforehand. Santosh, Kumar, Sarma, and Radhakrishnan (2007) provide further evidence on this topic showing that, of their sample, 55% concealed their seizures fearing that their partner would not marry them upon knowing of their seizures. Of those that did conceal their disorder a significant amount reported that their marriage ended once their seizures were discovered.

Non-epileptic Seizures, Emotion Regulation, and Marriage

The majority of individuals who seek treatment for seizures are treated for epilepsy, but 5 to 20% are actually diagnosed with psychogenic non-epileptic seizures (PNES) (Benbadis & Hauser, 2000). PNES is associated with seizure like behaviors, but when undergoing an EEG these patients show no epileptiform activity, this is considered not a neurological condition, but a psychiatric condition (LaFrance et al., 2006). More specifically it is often characterized as a conversion, dissociative, and/or post-traumatic stress reaction (Roberts & Reuber, 2014). Furthermore, Roberts and colleagues (2012) discuss that PNES could often be attributed solely to emotions, and an emotional response to stress. Roberts and colleagues (2012) further discuss that

PNES individuals often experience trauma, and that the development of PNES may be a coping mechanism for the stress of the trauma or emotional upset.

While research does show that epilepsy and PNES are caused by different mechanisms, research also shows that the experience of seizures, regardless if they are epileptic or non-epileptic, are associated with emotion regulation difficulties, cognitive impairments, mental and physical health issues, and disruptions in personal relationships, specifically marriages and romantic relationships. For example, Urbanek, Harvey, McGowan, and Agrawal (2014) reported that compared to controls, PNES individuals reported significantly less understanding of their emotions, more negative beliefs about their emotions, and a greater tendency to control emotional expression. These difficulties represent both internal and external emotion regulation difficulties that individuals suffering from a seizure disorder can experience. PNES individuals compared to controls showed cognitive impairments in terms of having difficulty switching between emotion and non-emotion face categorizations (Gul & Ahmad, 2014). This demonstrated that it was harder for PNES individuals to shift their attention away from the emotion task, causing a delay in beginning the non-emotion task. In addition, PNES individuals were more likely than healthy controls to use emotional suppression as an emotion regulation strategy, and suppression was associated with the observed cognitive (switching) deficits.

There is very little research that has looked at specifically the effects PNES has on a marriage. This could be that similar to individuals with epilepsy, PNES individuals are at heightened risk of remaining single and not marrying. There is evidence to support that family functioning and relationship quality is diminished in individuals with PNES. In one such article that compared family functioning with individuals who had epilepsy to PNES, it was shown that

individuals with PNES are more likely to show decreased levels of family functioning that could be attributed to reports of lower qualities of life, higher frequency of seizures, and more depressive symptoms compared to epileptics (LaFrance et al., 2011).

It is evident that emotion regulation difficulties and marital status are related to seizure disorders, but most studies have not examined the interrelationships among emotion regulation, marital status, and impact of seizures. Understanding if emotion regulation difficulties and marital status are related to seizure disorders can offer a better understanding of an individual's experience with epilepsy and PNES.

OVERVIEW OF CURRENT STUDY

For the present study I investigated in a sample of individuals with seizure disorders whether being married and having fewer emotion regulation difficulties would lessen the impact of seizures on participants' lives. Individuals who self-reported having a seizure disorder took part in a survey that assessed their emotion regulation difficulties, impact of seizures on their life, and their current marital status. Two aspects of emotion regulation difficulties were examined: difficulty accepting emotions, and difficulty engaging in goal-directed behavior when experiencing negative emotional upset. Seizure impact was measured with a standard questionnaire and included the domains of work, relationships, health, and feelings about one's self and one's goals. In addition to the primary analyses comparing individuals who were married versus unmarried with respect to emotion regulation and seizure impact, I also explored the effects of being in a romantic relationship (married, cohabiting, or in a relationship but not living together) versus being single, to determine whether marriage specifically or being in a relationship more generally yields benefits for those with seizures.

HYPOTHESES

It was hypothesized that among individuals with seizure disorders:

H1: Married individuals will report fewer emotion regulation difficulties than unmarried individuals. For this study, emotion regulation difficulties was operationalized as less acceptance of emotions, and greater difficulty engaging in goal directed behavior when upset, per the Difficulties in Emotion Regulation Scale.

H2: Married individuals will report being less affected by their seizures than unmarried individuals. This was expected based on the rationale that married individuals have a partner to offer more consistent social support, which in turn would ease the effects of experiencing seizures.

H3: Emotion regulation difficulties will be associated with a greater impact of seizures on one's life. Per previous literature, emotion regulation difficulties are commonly experienced by individuals with a seizure disorder, and emotion regulation difficulties in general are associated with worse physical and mental health outcomes. Thus it is expected that experiencing emotion regulation difficulties will contribute to seizures having a greater impact on an individual's life.

H4: The relationship between emotion regulation difficulties and seizure impact will be weaker for married than unmarried individuals. As noted above, this is consistent with the notion that having someone who is likely to provide social support will allow for better emotion regulation capabilities and therefore these married individuals will be less impacted by their seizures.

METHOD

Participants

Participants in the current study were 67 individuals who reported suffering from a seizure disorder. Doctor diagnoses were not collected; all seizures were self-reported by the individuals completing these surveys. Individuals responded to flyers posted in clinics and on social media sites for individuals with a seizure disorder (e.g., the Epilepsy Foundation website). Of the individuals in the current study 49 were female and 18 were male. In regards to relationship status, 26 individuals reported being married, 7 reported having a cohabitating relationship, 5 participants were in a relationship and not living together, 24 individuals were single, and 6 were previously married and now divorced. All individuals who completed the survey were over the age of 18; the mean age of respondents was 34.9 years (SD = 11.1). The majority of the sample were reported as Caucasian (n = 60) and of low income (n = 21). All participants filled out their online survey through a secure website, surveymonkey.com. Compensation for completing the survey was a $20 Target gift card. The study was approved by the Institutional Review Board (IRB) through Arizona State University.

Procedure

All participants were directed to a secure online link via surveymonkey.com to fill out the survey. The university's Institutional Review Board approved all procedures, and participation was taken as informed consent. . After completion of the survey respondents were directed to a page where they could enter contact information in order to receive a $20 Target gift card.

Measures

Impact of epilepsy. The Impact of Epilepsy Scale (IES) was used to assess the impact individuals felt their seizures had on eight different aspects of their lives (Jacoby et al., 1993). These eight aspects were relationship with spouse/partner, relationships with other close family members, social life/social activities, work, health, relationships with friends, feelings about self, and plans and ambitions for the future. All participants were asked to rate the impact their seizures had on these aspects of their lives using a 4-point scale from 1 = *not at all* to 4 = *a lot*. A reliability analysis was performed for this scale and it showed adequate reliability (Cronbach's α = .88).

Emotion regulation difficulties. The Difficulties in Emotion Regulation Scale (DERS) was used to assess how prominent emotion regulation difficulties were in individuals' lives (Gratz & Roemer, 2004). This scale was designed to assess emotion dysregulation more comprehensively than previous measures. The DERS is a 36 item survey where respondents use a 5-point scale anchored by 1=*almost never (0–10%)*, 2=*sometimes (11–35%*), 3= *about half the time (36–65%*), 4=*most of the time (66–90%*), and 5=*almost always (91–100%*) to answer questions regarding their emotions and feelings about their emotions. These questions reflect six facets of emotion regulation difficulties. Two subscales of the DERS were of particular interest to this study, non-acceptance of emotions, and ability to engage in goal directed behavior when upset. These scales (which were correlated, $r(56) = .54$, $p = .000$) are discussed in greater detail below.

Difficulties in Emotion Regulation subscale: Non-Accept. The DERS non-accept subscale is comprised of 6 items that reflects a tendency to have negative secondary emotional

responses to one's negative emotions, or non-accepting reactions to one's distress (Gratz & Roemer, 2004). This subscale showed strong internal consistency (Cronbach's $\alpha = .92$). Items included, "When I am upset, I feel guilty for feeling that way" and, when I'm upset, I become irritated with myself for feeling that way."

Difficulties in Emotion Regulation subscale: Goals. The DERS goals subscale is comprised of 5 items that reflect difficulties concentrating and accomplishing tasks when experiencing negative emotions (Gratz & Roemer, 2004). This subscale also showed adequate internal consistency (Cronbach's $\alpha = .87$). Items included, "When I'm upset, I have difficulty getting work done" and, "When I'm upset, I have difficulty thinking about anything else."

Marital status. Marital status was an item of interest in that it was necessary to ascertain the marital status of the individuals in this study. Respondents had the option of choosing from single, in a relationship (not living together), in a relationship (living with romantic partner), married, previously married (now separated), previously married (now divorced), previously married (now widowed), and other with a space to add a response. For this study I was more specifically interested in studying the population that reported being married, due to the limited presence of research that looks at the relationship of being married and having a seizure disorder.

Marital satisfaction. One item was used from the Locke Wallace Marital Adjustment Test (1959). This item asked, "If you are currently in a relationship, please rate on the scale below which best describes how happy your current relationship/marriage is. The middle point "happy" represents the degree of happiness you believe that most people get from romantic relationships." This was used to obtain a general idea of how happy participants who reported being a relationship were.

Demographics. Demographic information on participants was also collected. This information included age, ethnicity, socioeconomic status, types of seizures experienced, and whether seizure diagnosis was obtained via EEG monitoring. Marital status, as reported above, and demographic and health measures not relevant to the present study also were collected.

RESULTS

Descriptive Results for Primary Study Variables

Means and standard deviations for the primary variables of interest, namely impact of epilepsy, difficulties in emotion regulation-non-acceptance subscale, and difficulties in emotion regulation-goals subscale, are presented by marital status in Table 2.

Preliminary Analyses Examining Seizure Diagnosis

Although an official seizure diagnosis was not available for participants in this study, participants reported whether or not they believed epilepsy was a part of their diagnosis. Participants who believed they had epilepsy versus those who did not (e.g., who instead believed they had non-epileptic seizures or were uncertain of their seizure diagnosis) did not differ in IES scores, $F(1,57) = 0.25$, $p = .621$, or DERS scores: DERS-Non-Accept, $F(1, 54) = 0.07$, $p = .800$, and DERS-Goals, $F(1, 54) = 0.00$, $p = .998$. Given the lack of differences, the lack of reliability of participants' self-reported seizure diagnoses, and the small sample size for the group who did not believe epilepsy was part of their diagnosis, the remaining analyses combined participants across seizure type.

Effects of Marital Status on Emotion Regulation Difficulties (Hypothesis 1)

The first hypothesis predicted that married individuals would report fewer emotion regulation difficulties (non-acceptance of emotions and difficulty engaging in goals) compared to unmarried participants. This hypothesis was tested using two univariate analyses of variance with marital status as the predictor and the outcome variable as either Difficulties in Emotion Regulation *non-acceptance* subscale or Difficulties in Emotion Regulation *goals* subscale. There were not significant differences between married and unmarried participants in terms of emotion regulation difficulties for either of the DERS subscales: non-acceptance of emotions, $F(1, 59) = .01$, $p = .911$; difficulty with goal-directed behavior, $F(1, 59) = .04$, $p = .852$ (see Table 2). Hypothesis 1 was therefore not supported.

Effects of Marital Status on Impact of Seizures (Hypothesis 2)

The second hypothesis predicted that married individuals would report being less affected by their seizures than unmarried individuals. This hypothesis was tested first with a univariate analysis of variance and then examined in the context of a larger linear regression model (see Hypothesis 4). The predictor was marital status and the outcome variable was the Impact of Epilepsy Scale average. Results showed that married individuals were significantly *more* impacted by their seizures than unmarried individuals, $F(1, 62) = 4.72$ $p = .034$. Notably, this effect was only significant at the trend-level when removing the IES item, "impact of seizures on relationship with spouse or partner," $F(1, 62) = 3.45$, $p = .068$. This finding also was no longer significant in the context of a larger regression model (see Tables 3 and 4).

Relation between Emotion Regulation Difficulties and Impact of Seizures (Hypothesis 3)

The third hypothesis predicted that there would be a significant relationship between difficulties in emotion regulation and the impact of seizures. This was first tested as a correlation and then assessed in the context of a larger linear regression model (see Hypothesis 4). There were significant correlations between the impact of seizures on participants' lives and the amount of emotion regulation difficulties reported: impact of seizures and non-acceptance of emotions, $r(56) = .276$, $p = .036$; impact of seizures and difficulty with goals, $r(56) = .291$, $p = .027$. These relationships remained significant in the context of a larger regression model (see Tables 3 and 4).

Marital Status as a Moderator of the Relationship between Emotion Regulation Difficulties and Impact of Seizures (Hypothesis 4)

The fourth hypothesis predicted that the relationship between emotion regulation difficulties and seizure impact would be weaker for married than unmarried individuals (i.e., a moderation effect of marital status). This hypothesis was tested using hierarchical linear regression. Marital status was entered on Step 1, emotion regulation difficulties (non-acceptance or difficulty with goals) were entered on Step 2, and the interaction of marital status and emotion regulation difficulties was entered on Step 3. Variables were centered prior to calculating the interaction term. To test whether there was a significant moderation effect, the significance of the beta weights for the interaction term as well as the change in R^2 after entering the interaction term were examined. Results from the two different regression analyses based on the two emotion regulation difficulties variables are discussed below.

Hierarchical regression with emotion regulation difficulty variable, non-acceptance of emotions. Together, the three predictors accounted for a significant portion of the variance in seizure impact, adjusted R^2 = .157, $F(3, 54) = 4.54$, p = .007. At Step 1 of the analysis, marital status was a marginally significant predictor of impact of epilepsy scores, b = .39, SE = .20, $t(57) = 1.92$, p = .060. At Step 2 of the analysis, marital status remained marginally-significant, and there was a main effect of the DERS-non-acceptance of emotions variable, b = .18, SE = .08, $t(57) = 2.17$, p = .035. Marital status and DERS-non-acceptance together (Step 2) accounted for 10.4% of the variance of impact of seizures, and DERS-non-accept significantly increased the variance accounted for by the model, change in R^2 = .074, p = .035. At Step 3 of the model the main effects of marital status and DERS-non-accept were both marginally-significant, and were qualified by a significant interaction of marital status and DERS-non-accept in predicting impact of seizures scores, b = .34, SE = .16, $t(57) = 2.11$, p = .039 (see Table 3). There was a significant increase in the proportion of variance accounted for by the model when adding the interaction term (change in R^2 = .066, p = .039), indicating a significant moderation effect of marital status (see Table 3). Follow up analyses for married and unmarried participants revealed that for married participants, DERS-nonaccept and IES showed a significant positive relationship, $r(23) = .56$, p = .006, whereas for unmarried participants, DERS-nonaccept and IES were not related, $r(35) = .04$, p = .809. The results of these analyses show that marital status did moderate the relationship between emotion regulation difficulties and impact of seizures with respect to difficulty accepting negative emotions; however, the specific direction of the findings was the opposite of that predicted, because there was a stronger relationship between the DERS and the IES for married rather than unmarried participants.

Hierarchical regression with emotion regulation difficulty variable, difficulty with goals. Together, the three predictors accounted for significant variance in impact of seizures, adjusted R^2 = .092, $F(3, 54) = 2.93$, p = .042. At Step 1 of the analysis, marital status was a marginally-significant predictor of impact of epilepsy scores, b = .39, SE = .20, $t(56)$, p = .060. At Step 2 of the analysis, marital status remained marginally-significant and the DERS-goals scale was a significant predictor of impact of epilepsy scores, b = .22, SE = .10, $t(56)$, p = .030. Marital status and DERS-goals (Step 2) accounted for 10.8% of the variance of impact of seizures, and DERS-goals significantly increased the variance accounted for by the model, change in R^2 = .078, p = .030. At Step 3 of the analysis, marital status remained marginally-significant and DERS-goals remained significant; however, the interaction of Marital Status and DERS-goals was not significant in predicting impact of epilepsy scores, b = .03, SE = .21, $t(56)$ = .13, p = .899. This did also not enhance the variance accounted for by the model, change in R^2 = .000, p = .899. Thus, the hypothesis was not supported, as marital status did not moderate the relationship between difficulties engaging in goal-directed behavior when upset and the impact of epilepsy (see Table 4).

Additional Analyses Examining Relationship Satisfaction

Although the primary analyses focused on marital status, relationship satisfaction based on a single-item measure (described earlier) also was examined for married participants. On average, married participants reported being "happy" in their relationship (M = 4.9, SD = 1.5). Relationship satisfaction was not related to DERS-non-accept, DERS-goals, or IES scores, rs < .26, ps > .23 (n = 23 or 24).

Hierarchical linear regressions structured similarly to those reported above but including relationship satisfaction in place of marital status were examined for married participants. For the first regression, DERS-nonacceptance of emotion scores significantly predicted IES scores (β = .52, t = 2.67, p = .015) and contributed significant variance to the model (adjusted R^2= 0.20, change in R^2= .27, p = .015). Relationship satisfaction was not a significant predictor of IES scores (β = -.01, t = -.04, p = .967), nor was its interaction with DERS-nonaccept scores (β = -.07, t = -0.33, p = .743; adjusted R^2= .16, change in R^2= .00, p =.743). For the second regression, neither relationship satisfaction (β = -.01, t = -.04, p = .967, as reported above), DERS-goals (β = .30, t = 1.30, p = .209), or their interaction (β = -.02, t = -.07, p = .947) were significant in predicting IES scores.

Additional Analyses Examining Marriage and Marital-Type Relationships

The primary questions of interest and corresponding analyses focus on married versus unmarried participants. Additional exploratory analyses examined (1) participants who were married or cohabiting, and (2) participants who were married, cohabiting, or in a relationship but not living with their partner.

When running these analyses, there were no significant changes in results for any of the hypotheses except for the fourth hypothesis, marital status as a potential moderator for the relationship between difficulties in emotion regulation and impact of seizures. The difference for this hypothesis was that both relationship status groups (married or cohabitating, and married, cohabitating, or in a relationship) no longer showed a significant moderation effect with respect to the relationship between emotion regulation difficulties and impact of seizures. In other words, marital status (i.e., married or unmarried) moderated the relationship between emotion

regulation and impact of seizures, but relationship status more broadly (i.e., married and cohabiting, or married, cohabiting, and in a relationship but not living together, versus single) did not. See Tables 6 and 7 for the regression models of married or cohabitating, and Tables 8 and 9 for the regression models of married, cohabitating, or in a relationship.

Discussion

This study examined whether being married would reduce the amount of difficulties in emotion regulation and in turn the impact of seizures faced by individuals suffering from a seizure disorder. Specifically, this study hypothesized that (1) married individuals would report fewer emotion regulation difficulties than unmarried individuals, (2) married individuals would be less impacted by their seizures than unmarried individuals, (3) fewer emotion regulation difficulties in general would be associated with a lower impact of seizures on one's life, and (4) the relationship between emotion regulation difficulties and impact of seizures would be weaker for the married than unmarried individuals. Two aspects of emotion regulation difficulties were assessed: difficulty accepting emotions and difficulty engaging in goal-directed behavior when upset.

The first hypothesis was not supported, in that married and unmarried individuals did not differ in regard to reported emotion regulation difficulties for either aspect of emotion regulation measured. For the second hypothesis, results were in the opposite direction than predicted: Married individuals reported being *more* affected by their seizures than unmarried individuals. Third, emotion regulation difficulties were not associated with seizure impact across participants; however, and with respect to the fourth hypothesis, marital status moderated the relationship between one aspect of emotion regulation difficulties, namely difficulty accepting emotions, and

impact of seizures. Contrary to predictions, greater non-acceptance of emotions predicted a greater impact of seizures for married but not unmarried individuals.

Marriage May Cause More Stress for an Individual with a Seizure Disorder

According to the results of this study, married individuals reported that they felt more impacted by their seizures compared to the non-married individuals. While more research would need to be done to see if this is replicated, this could be a very important finding. For an individual with a seizure disorder it might be that a marriage is too much additional stress for them, and this could account for this finding. It might also be that the individual's spouse may not be readily equipped to handle and be of help with their partner's illness, and may burden their partner with their frustrations of not being able to help.

It was initially hypothesized that married individuals would report being less affected by their seizures compared to the non-married individuals because a large body of research shows that social support, particularly that gained through marriage, can be exceptionally beneficial to someone coping with an illness. It is interesting to find that in the present study the reverse was found, in that married individuals reported being more impacted by their seizures than unmarried individuals. It could be that with a larger sample size a different result might have been attained, or it could be that individuals with a seizure disorder respond differently to a marriage than individuals with other health conditions. For example, there is still a large amount of stigma that individuals with seizures face that is not always connected with other health concerns; this could contribute to additional emotional problems and a rift even from one's partner. Notably, the measure of seizure impact included an item that specifically assessed the impact of seizures on relationship with their spouse or partner; when omitting this item from the full scale, there was

only a trend-level difference in seizure impact between married and unmarried participants. Therefore, the most profound impact of seizures on one's life may be on the person's partner relationship.

Similarly, difficulties with emotion regulation may be problematic in terms of seizure impact insofar as they impact one's marriage, given that emotion regulation difficulties and seizure impact were related for married but not unmarried individuals. This was the case specifically for non-acceptance of negative emotions, which, as measured in the present study reflects that the person becomes upset and then also feels angry, embarrassed, ashamed, guilty, or weak as a result of feeling that way (Gratz & Roemer, 2004). Perhaps someone who is married is more likely to feel judged--and, if in a lower quality relationship is in fact judged--when they are upset, in turn exacerbating their original upset.

Importance of relationship quality. The majority of the research suggesting marriage is good for illness also indicates the marriage needs to be of reported good quality. In the present study, relationship satisfaction was not associated with emotion regulation difficulties, impact of seizures, or the association between the two. As stated below in the Limitations section, the present study did not sufficiently assess relationship satisfaction, as this construct was assessed with a single item. Further, the sample of married participants was small. Nevertheless, perhaps with a highly disabling and unpredictable condition such as seizures, simply being married, regardless of the level of satisfaction with that relationship, is associated with a greater sense of seizure impact on one's life.

Why Would Non-Acceptance be Significant and Not Goals for Difficulties in Emotion Regulation

The results indicated that marital status mattered when examining the relationship between difficulty accepting emotions and seizure impact, but this was not the case when considering difficulty engaging in goal-related behavior when upset. According to this it seems that in the context of a marriage, an individual with a seizure disorder who is more accepting of their emotions has an easier time managing his or her seizure disorder, but being better able to achieve goals in the face of emotional upset does not correspond to a reduced impact of seizures.

Limitations

There were some specific methodological limitations that may have influenced the results. The sample size ($N = 67$), was small, which could have led to insufficient power to detect effects found in the sample population. The married individuals ($n = 27$) of the population is an even smaller amount, that can hardly be an accurate generalization of married individuals with a seizure disorder. A larger sample size is needed to accurately test the effects marital status has on emotion regulation difficulties and the impact of seizures. Without formal patient diagnoses and a larger sample, comparisons of those with epileptic versus non-epileptic seizures (e.g., PNES) were limited, in turn limiting the understanding that could be gained about marital relationships in these two groups.

In order to better understand how seizures affect a marriage, as noted earlier it is necessary to evaluate the quality of the marriage. It also would be important to study the spouse of the seizure individual. This would have been an important aspect of the study for it then

would have been possible to learn how a spouse is affected by their partner's seizures, and how the two individuals differ on survey responses. Future studies should implement a way to incorporate the spouses' feelings and emotions to being married to someone with a seizure disorder.

Implications

Most of past research on seizure disorders focuses on the emotion regulation difficulties experienced by the individuals. No known study, to date, has studied the effects a marriage can have on these emotion regulation difficulties and the corresponding perceived impact of the seizure disorder.

It is important for this area to be studied further as past research has shown that emotion regulation is not always an individual process, but sometimes can benefit from dyadic involvement that can contribute to the transmission of positive emotions and also assist in the down regulation of negative emotions. Perhaps clinicians can work with these individuals to help foster healthy communication and coping strategies, to facilitate effective emotion regulation in both partners.

More research may prove that marriage is just not a beneficial process for individuals with a seizure a disorder. Marriage could bring along more stress that they cannot handle and thus increases the difficulties already experienced by them. It may also be that the emotional and cognitive impairments that are common for individuals with a seizure disorder prevent them from being able to foster healthy marriages, and their illness may be too demanding.

Current research shows that individuals who suffer from a seizure disorder are at a heightened risk for never marrying. One possible reason described in research is that individuals with a seizure disorder are less likely to marry due to negative stigmatization that still exists, which could inhibit individuals from seeking a romantic relationship. This stigmatization that individuals with a seizure disorder might face, may lead these individuals to feel that they must hide their seizures from their romantic partner. Once the seizures are discovered this often leads to a closure of the relationship. For those who do get married, current research shows that a high number divorce, and report seizures as a primary reason for the divorce. Divorce can put a lot of stress on a healthy individual; for someone who is already dealing with the stress of a sometimes difficult illness, divorce is an unneeded stressor.

After a thorough literature review and conducting this study, it seems that while the causes of epilepsy and PNES are for certain very different, the way the seizures affect the individual's life may be similar in many respects. Individuals with epilepsy and PNES report many shared ailments, including emotion regulation difficulties, cognitive impairments, difficulties in relationships, and health problems associated with the illness. While PNES is said to be caused more by emotional factors and epilepsy by more biological causes, perhaps more research should look at how to combat the similar effects felt by the seizures to help minimize the overall impact of seizures. PNES individuals may feel that they are not being effectively taken care of, as little is still known about the exact origins and causes of their illness.

Future Research

Future research is needed to see how marital status affects the impact of seizures and emotion regulation difficulties felt by individuals suffering from a seizure disorder. Future research should work to gain a larger sample size to better test the effects marriage has on these individuals' lives. It is also highly important that a measure more fully assessing relationship satisfaction be put in place to better understand the quality of the marital relationships being studied. A more thorough understanding of how marriage can account for some of the negative impacts associated with a seizure disorder is of utmost importance for clinicians to recognize, such that they know to help foster healthy relationships among these individuals. Further research should also work to see if there are reported differences in the way epileptic and PNES individuals are affected by their seizures. If it is the case that both types of individuals are affected in a similar manner, treatment of their emotion dysregulation can be similar.

Conclusion

Past research shows that individuals suffering from a seizure disorder are often faced with emotion regulation difficulties that can range from difficulties in accepting emotions, setting goals for behavior, having successful emotion regulation strategies, and impulse control issues. Research also shows that typically social support, often found in a good quality marital relationship, can be an important way to help counteract some of the negativities of an illness. However, there is a lack of support for this finding in the context of individuals suffering from a seizure disorder. On the contrary, much research shows that individuals with a seizure disorder are less likely to ever marry, sometimes hide their disorder from a romantic partner, and that seizures are the main cause of divorce for these individuals. Research needs to be continued to help understand the effects marriage has on the individuals, and if fostering a healthy marital relationship can help alleviate some of the negative impacts the seizures have and also help with emotion regulation difficulties.

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Table 1.

Sample Demographics

Demographics	N	%
Gender		
Male	18	26.9
Female	49	73.1
Ethnicity		
African American	2	3.0
Asian American	1	1.5
Hispanic	8	11.9
Caucasian	49	73.1
Education		
Graduated High School	7	16.3
1-4 Years of College	21	60.4
4+ Years of College	9	21.0
Professional Degree	1	2.3
Socioeconomic Status		
Lower Income	21	31.3
Lower Middle Income	20	29.9
Middle Income	19	28.4
Upper Middle Income	5	7.5
Marital Status		
Single	24	35.8
In a Relationship, not living together	5	7.5
In a relationship, living together	7	10.4
Married	26	38.8
Previously Married, Now Divorced	6	9.0
Seizure diagnosis		
Has had an EEG to diagnose seizure type	23	34.3
Believes epilepsy is part of diagnosis	49	80.3

Table 2.

Mean (SD) Impact of Seizures and Emotion Regulation Difficulties by Marital Status

	Marital Status	
Measure	Married	Non-married
Impact of Epilepsy Scale	3.0 (.80)$_a$	2.57 (.72)$_b$
Difficulties in Emotion Regulation: Non-Acceptance	2.46 (1.27)$_a$	2.42 (1.13)$_a$
Difficulties in Emotion Regulation: Goals	3.22 (.96)$_a$	3.17 (1.02)$_a$

Note. Different subscripts within a row indicate a significant mean difference, $p < .05$.

Table 3.

Regression Model Predicting Impact of Seizures from Marital Status[a] and Emotion Regulation-Non-acceptance of emotions

Step # and Predictors	*B*	SE *B*	β	R^2 Change
1. Marital Status	.388	.202	.248†	.062†
2. DERS non-accept	.176	.081	.271*	.074*
3. Marital Status X DERS non-accept	.335	.159	.259*	.066*

†$p < .10$ *$p < .05$. [a]Married versus unmarried.

Table 4.

Regression Model Predicting Impact of Seizures from Marital Status[a] and Emotion Regulation—Difficulty with Goals when Upset

Step # and Predictors	*B*	SE *B*	β	R^2 Change
1. Marital Status	.388	.202	.248†	.062†
2. DERS goals	.221	.099	.280*	.078*
3. Marital Status X DERS goals	.026	.206	.016	.000

†$p < .10$ *$p < .05$. [a]Married versus unmarried.

Table 5.

Regression Model Predicting Impact of Seizures from Marital-type Relationship Status[a] and Emotion Regulation--Non-acceptance of emotions

Step # and Predictors	*B*	SE *B*	β	R^2 Change
1. Marital Status	.286	.200	.187	.035
2. DERS non-accept	.187	.082	.288*	.082*
3. Marital Status X DERS non-accept	.204	.164	.157	.025

*$p < .05$. [a]Married or cohabitating versus single.

Table 6.

Regression Model Predicting Impact of Seizures from Marital-type Relationship Status[a] and Emotion Regulation--Difficulty with Goals when Upset

Step # and Predictors	*B*	SE *B*	β	R^2 Change
1. Marital Status	.286	.200	.187	.035
2. DERS goals	.236	.100	.298*	.089*
3. Marital Status X DERS goals	.102	.201	.064	.004

*$p < .05$. [a]Married or cohabitating versus single.

Table 7.

Regression Model Predicting Impact of Seizures from Relationship Status[a] and Emotion Regulation—Non-acceptance of emotions

Step # and Predictors	*B*	SE *B*	β	R^2 Change
1. Marital Status	.324	.203	.209	.044
2. DERS non-accept	.173	.083	.266*	.071*
3. Marital Status X DERS non-accept	.200	.173	.149	.022

*$p < .05$. [a]Married, cohabitating, or in a relationship versus single.

Table 8.

Regression Model Predicting Impact of Seizures from Relationship Status[a] and Emotion Regulation—Difficulty with Goals when Upset

Step # and Predictors	*B*	SE *B*	β	R^2 Change
1. Marital Status	.324	.203	.209	.044
2. DERS goals	.237	.099	.299*	.089*
3. Marital Status X DERS goals	.087	.202	.055	.003

*$p < .05$. [a]Married, cohabitating, or in a relationship versus single.

APPENDIX A

INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL

APPROVAL:CONTINUATION

Nicole Roberts Social and Behavioral Sciences, School of 602/543-3911
Nicole.A.Roberts@asu.edu

Dear Nicole Roberts:

On 2/23/2014 the ASU IRB reviewed the following protocol:

Type of Review:	Modification and Continuing Review
Title:	Emotion and the Brain
Investigator:	Nicole Roberts
IRB ID:	0702001615
Category of review:	(4) Noninvasive procedures, (7)(b) Social science methods, (7)(a) Behavioral research
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Roberts Consent 1_SurveyOnlyFirst25_Feb2013.pdf, Category: Consent Form; • Roberts Consent 2_SurveyOnlyPost25_Feb2013.pdf, Category: Consent Form; • Roberts Consent 3a_SurveyPlusLab_HardCopySurvey_Feb2013.pdf, Category: Consent Form; • Roberts Consent 3b_SurveyPlusLab_OnlineSurvey_Feb2013.pdf, Category: Consent Form; • Roberts Consent 3c_SurveyPlusLab_Lab_Feb2013.pdf, Category: Consent Form; • IRB Bioscience Application_Roberts March 2007_forFeb2014.doc, Category: IRB Protocol; • Frey CITI training 26Aug11.pdf, Category: Non-ASU human subjects training (if taken within last 3

	years to grandfather in); • Pearson CITI training 24Jun11.pdf, Category: Non-ASU human subjects training (if taken within last 3 years to grandfather in); • Strom CITI training 28Feb12.pdf, Category: Non-ASU human subjects training (if taken within last 3 years to grandfather in); • Description of non-ASU individuals included, Category: Other (to reflect anything not captured above); • UCDenver IRB Director Letter.pdf, Category: Other (to reflect anything not captured above); • RecruitmentFlyer_TraumaExposedControls, Category: Recruitment Materials; • RecruitmentSocialMediaAnnouncement, Category: Recruitment Materials; • RecruitmentFlyer_SurveyOnlyPortion, Category: Recruitment Materials; • RecruitmentScript_Survey, Category: Recruitment Materials; • RecruitmentScript_LabSession, Category: Recruitment Materials; • RecruitmentFlyer_LabPortion2, Category: Recruitment Materials;

The IRB approved the protocol from 2/23/2014 to 2/28/2015 inclusive. Three weeks before 2/28/2015 you are to submit a completed "FORM: Continuing Review (HRP212)" and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 2/28/2015 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,
IRB Administrator

APPENDIX B

STUDY MEASURES

Impact of Epilepsy Scale (IES)

Using the following scale, please rate how much each aspect of your life is impacted by your seizures and their treatment.

Not at all **A lot**

1 2 3 4

1. _____Relationship with spouse/partner
2. _____Relationship with other close family members
3. _____Social life/social activities
4. _____Work
5. _____Health
6. _____Relationships with friends
7. _____Feelings about self
8. _____Plans and ambitions for the future

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line next to each item:

1	2	3	4	5
almost never	sometimes	about half the time	most of the time	almost always
(0-10%)	(11-35%)	(36-65%)	(66-90%)	(91-100%)

1. _____ I am clear about my feelings.
2. _____ I pay attention to how I feel.
3. _____ I experience my emotions as overwhelming and out of control.
4. _____ I have no idea how I am feeling.
5. _____ I have difficulty making sense out of my feelings.
6. _____ I am attentive to my feelings.
7. _____ I know exactly how I am feeling.
8. _____ I care about what I am feeling.
9. _____ I am confused about how I feel.
10. _____ When I'm upset, I acknowledge my emotions.
11. _____ When I'm upset, I become angry with myself for feeling that way.
12. _____ When I'm upset, I become embarrassed for feeling that way.
13. _____ When I'm upset, I have difficulty getting work done.
14. _____ When I'm upset, I become out of control.
15. _____ When I'm upset, I believe that I will remain that way for a long time.
16. _____ When I'm upset, I believe that I'll end up feeling very depressed.
17. _____ When I'm upset, I believe that my feelings are valid and important.
18. _____ When I'm upset, I have difficulty focusing on other things.
19. _____ When I'm upset, I feel out of control.
20. _____ When I'm upset, I can still get things done.
21. _____ When I'm upset, I feel ashamed with myself for feeling that way.
22. _____ When I'm upset, I know that I can find a way to eventually feel better.
23. _____ When I'm upset, I feel like I am weak.
24. _____ When I'm upset, I feel like I can remain in control of my behaviors.
25. _____ When I'm upset, I feel guilty for feeling that way.
26. _____ When I'm upset, I have difficulty concentrating.
27. _____ When I'm upset, I have difficulty controlling my behaviors.
28. _____ When I'm upset, I believe that there is nothing I can do to make myself feel better.
29. _____ When I'm upset, I become irritated with myself for feeling that way.
30. _____ When I'm upset, I start to feel very bad about myself.
31. _____ When I'm upset, I believe that wallowing in it is all I can do.
32. _____ When I'm upset, I lose control over my behaviors.
33. _____ When I'm upset, I have difficulty thinking about anything else.
34. _____ When I'm upset, I take time to figure out what I'm really feeling.
35. _____ When I'm upset, it takes me a long time to feel better.
36. _____ When I'm upset, my emotions feel overwhelming.